

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2025*****Fourth Semester******Civil Engineering*****CE 3404 – Soil Mechanics*****Regulations - 2021******Duration : 3 Hrs******Maximum : 100 Marks******PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)***

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
1.	Draw the two phase and three phase diagrams.	L1	1	2
2.	What are the Atterberg's limits?	L1	1	2
3.	State Darcy's law.	L1	2	2
4.	What is quick sand condition? List the conditions for the occurrence of quick sand condition.	L1	2	2
5.	State the assumptions of Boussinesq equation.	L2	3	2
6.	What are the stages of consolidation?	L1	3	2
7.	What is stress path?	L1	4	2
8.	Differentiate between cyclic and mobility liquefaction.	L2	4	2
9.	Name the different types of slope failure.	L1	5	2
10.	Define Taylor's stability number and mention its utilization for slope stability analysis.	L1	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
11.	a Explain Indian Standard soil classification system.	L3	1	16
	Or			
	b A compacted cylindrical specimen 50 mm diameter and 100 mm long is to be prepared from dry soil. If the specimen is required to have a water content of 15% and the percentage of air voids is 20, calculate the weight of soil and water required in the preparation of soil where specific gravity = 2.69.	L3	1	16
12.	a The falling head permeability test was conducted on a soil sample of 4cm diameter and 18cm length. The head fell from 1.0m to 0.40m in 20 minutes. If the cross-sectional area of the stand pipe was 1cm ² , determine the coefficient of permeability.	L3	2	16

Or

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|-----------|--|----|---|----|
| b | A layer of saturated clay 4 m thick is overlain by sand 5m deep, the water table is 3m below the surface. Saturated unit weight for clay is 19 kN/ m^3 and sand is 20 kN/ m^3 . Bulk unit weight of sand above water table is 17 kN/m^3 .
(i) Plot the total stress, effective stress against depth. If sand to a height of 1m above water table is saturated with capillary water, how are the above stress affected.
(ii) If in 1st case a 4 m deep sand layer of bulk unit weight is 20 kN/m^3 is placed over the surface. Find the effective vertical stress at the centre of clay layer immediately after the fill has been placed and many years after the fill has been placed. | L3 | 2 | 16 |
| Or | | | | |
| 13. a | Explain the Newmark's influence chart in detail. And also mention its uses. | L3 | 3 | 16 |
| Or | | | | |
| b | Explain Terzaghi's one dimensional consolidation theory with a neat sketch and assumptions. | L3 | 3 | 16 |
| 14. a | Explain the direct shear test to determine the shear strength of soil. Mention its merits and demerits. | L3 | 4 | 16 |
| Or | | | | |
| b | How to reduce liquefaction in soil? Explain all methods with neat sketch. | L3 | 4 | 16 |
| 15. a | Explain the procedure of stability analysis in infinite slopes. | L3 | 5 | 16 |
| Or | | | | |
| b | Analyze the stability of soil using friction circle method with neat sketch. | L3 | 5 | 16 |